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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,336	04/07/2006	Hironori Kobayashi	4700.P0326US	1816

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EXAMINER	
DOLLINGER, MICHAEL M	

ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
02/17/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,336	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	MICHAEL DOLLINGER	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/06/2008 and 12/10/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al (US 5,391,664) in view of Kumagai et al (US 6,710,181 B2)

3. Takei et al disclose polyurethanes derived from a hydroxyl functional polymer (A) and a polyfunctional isocyanate compound (g) wherein the molar ratio NCO/OH is preferably in the range of from 0.8 to 1.2 [column 15 lines 62-68]. The polymer (A) contains vinyl-based monomers (a) including (meth)acrylic and acid alkyl (meth)acrylates [column 5 line 27] and perfluoroethylene [column 5 line 57]. The polyfunctional isocyanates include tolylene diisocyanate (TDI), diphenylmethane 4,4'-diisocyanate, hexamethylene diisocyanate (HDI), and isophorone diisocyanate [column 15 lines 30-38], as well as biurets including SUMIDUR N series [column 15 lines 38-40]. The reaction mixture may also include polyols other than polymer (A) including polyether polyol and polyester polyol [column 15 lines 3-9]. The polyurethane resins may be used for applications such as waterproof for paint film [column 19 line 26-27] or for a paint compositions [column 19 line 65 through column 20 line 5], adhesives [column 19 lines 27-28], a urethane foam [column 19 lines 31-32], and a thermosetting or thermoplastic type elastomer [column 19 lines 33-34].

4. Takei et al do not disclose the use of a silane coupling agent containing an imidazole group.

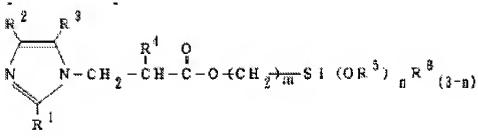
5. Kumagai et al disclose resin additive formed from the reaction of an imidazole [column 2 formula (1)] and a silane compound with a glycidoxy groups [column 3 formula (2)]. An example of the silane compound 3-glycidoxypropyltrimethoxysilane [column 4 line 42]. Kumagai et al teach that resin additives may be used with polyurethane resins [column 5 lines 59] and fluororesin [column 5 line 65] in an amount of preferably 0.1 to 20 parts by weight per 100 parts by weight of the resin [column 5 lines 43-47]. Kumagai et al also teach that the resin additives improve resin strength [column 5 lines 53-56] and adhesion to metals such as copper, steel or aluminum or an inorganic material such as glass fiber, silica, aluminum oxide or aluminum hydroxide [column 2 lines 22-26].

6. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined an imidazole containing silane coupling agent with a polyol and polyisocyanate containing resin composition because Takei et al teach that it is within the skill of the art to make polyurethane compositions from a polyol and a polyisocyanate and Kumagai et al teach that it is within the skill of the art to combine a polyurethane with a resin additive obtained from reacting an imidazole with a silane compound containing a glycidoxy group. One would have been motivated to do this because Kumagai et al teach that the silane coupling agent improves adhesion to various materials and also improves mechanical strength of the resin. This is combining prior art elements according to known methods to yield predictable results. Absent any evidence to the contrary, there would have been a reasonable expectation of success in

achieving improved adhesion and mechanical strength in a polyurethane resin by adding a silane coupling agent reacted with an imidazole compound.

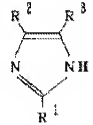
7. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al (US 5,391,664), discussed above, in view of Kumagai (JP 2000-297094 A).

8. Kumagai disclose a resin additive for improving mechanical strength of a resin and the adhesion to metal or glass fibers [0001] of the formula (1):

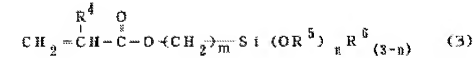


(1) [0008]

obtained by reacting an imidazole of formula (2) with an acrylic silane of formula (3):



(2)



(3)

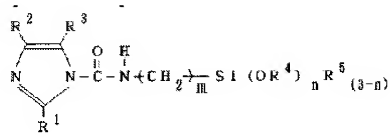
[0011].

Kumagai teaches that the resin additive should be used in an amount of 0.001 to 50 parts by weight per 100 parts by weight of resin [0021]. Kumagai also teaches that the resin additive improves adhesion properties of the resin to metals [0028].

9. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined an imidazole containing silane coupling agent with a polyol and polyisocyanate containing resin composition because Takei et al teach that it is within the skill of the art to make polyurethane compositions from a polyol and a polyisocyanate and Kumagai teaches that it is within the skill of the art to produce a resin additive obtained from reacting an imidazole with an acrylic silane compound. One would have been motivated to do this because Kumagai teaches that the silane coupling agent improves adhesion to various materials and also improves mechanical strength of the resin. This is combining prior art elements according to known methods to yield predictable results. Absent any evidence to the contrary, there would have been a reasonable expectation of success in achieving improved adhesion and mechanical strength in a polyurethane resin by adding a silane coupling agent reacted with an imidazole compound.

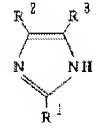
10. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al (US 5,391,664), discussed above, in view of Kumagai (JP 2000-297093 A).

11. Kumagai disclose a resin additive for improving mechanical strength of a resin and the adhesion to metal or glass fibers [0001] of the formula (1):

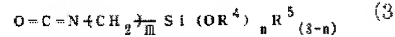


(1) [0008]

obtained by reacting an imidazole of formula (2) with a silane compound with an isocyanate group of formula (3):



(2)



(3)

[0011].

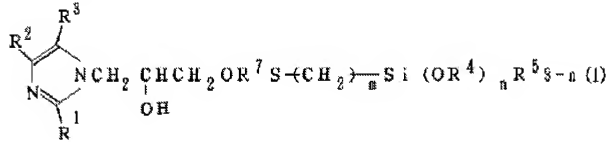
Kumagai teaches that the resin additive should be used in an amount of 0.001 to 50 parts by weight per 100 parts by weight of resin [0021]. Kumagai also teaches that the resin additive improves adhesion properties of the resin to metals [0028].

12. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined an imidazole containing silane coupling agent with a polyol and polyisocyanate containing resin composition because Takei et al teach that it is within the skill of the art to make polyurethane compositions from a polyol and a polyisocyanate and Kumagai teaches that it is within the skill of the art to produce a resin additive obtained from reacting an imidazole with a silane compound containing an

isocyanate group. One would have been motivated to do this because Kumagai teaches that the silane coupling agent improves adhesion to various materials and also improves mechanical strength of the resin. This is combining prior art elements according to known methods to yield predictable results. Absent any evidence to the contrary, there would have been a reasonable expectation of success in achieving improved adhesion and mechanical strength in a polyurethane resin by adding a silane coupling agent reacted with an imidazole compound.

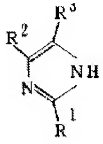
13. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al (US 5,391,664), discussed above, in view of Kumagai et al (JP 11-092482 A).

14. Kumagai et al disclose a resin additive for improving mechanical strength of a resin and the adhesion to metal or glass fibers [0001] of the formula (1):

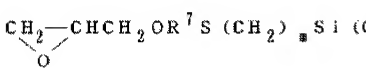


[0008]

obtained by reacting an imidazole of formula (2) with a silane compound with an epoxy group of formula (3):



(2)



(3)

[0012].

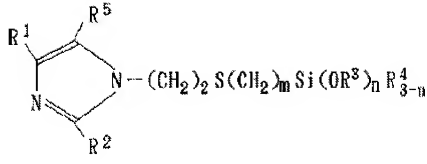
Kumagai et al teach that the resin additive should be used in an amount of 0.001 to 50 parts by weight per 100 parts by weight of resin [0021]. Kumagai et al also teach that the resin additive improves adhesion properties of the resin to metals [0029].

15. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined an imidazole containing silane coupling agent with a polyol and polyisocyanate containing resin composition because Takei et al teach that it is within the skill of the art to make polyurethane compositions from a polyol and a polyisocyanate and Kumagai et al teach that it is within the skill of the art to produce a resin additive obtained from reacting an imidazole with a silane compound containing an epoxy group. One would have been motivated to do this because Kumagai teaches that the silane coupling agent improves adhesion to various materials and also improves mechanical strength of the resin. This is combining prior art elements according to known methods to yield predictable results. Absent any evidence to the contrary, there would have been a reasonable expectation of success in achieving

improved adhesion and mechanical strength in a polyurethane resin by adding a silane coupling agent reacted with an imidazole compound.

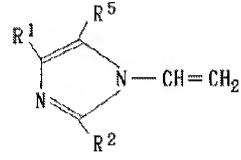
16. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei et al (US 5,391,664), discussed above, in view of Tsuchida et al (JP 09-295992 A).

17. Tsuchida et al disclose a resin additive for improving mechanical strength of a resin and the adhesion to metal or glass fibers [0001] of the formula (1):



(1) [0009]

obtained by reacting an imidazole of formula (2) with a silane compound with a mercapto group of formula (3):



(2)

(3)

[0011].

Tsuchida et al teach that the resin additive should be used in an amount of 0.001 to 50 parts by weight per 100 parts by weight of resin [0021]. Tsuchida et al also teach that the resin additive improves adhesion properties of the resin to metals [0024].

18. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined an imidazole containing silane coupling agent with a polyol and polyisocyanate containing resin composition because Takei et al teach that it is within the skill of the art to make polyurethane compositions from a polyol and a polyisocyanate and Tsuchida et al teach that it is within the skill of the art to produce a resin additive obtained from reacting an imidazole with a silane compound containing a mercapto group. One would have been motivated to do this because Tsuchida et al teach that the silane coupling agent improves adhesion to various materials and also improves mechanical strength of the resin. This is combining prior art elements according to known methods to yield predictable results. Absent any evidence to the contrary, there would have been a reasonable expectation of success in achieving improved adhesion and mechanical strength in a polyurethane resin by adding a silane coupling agent reacted with an imidazole compound.

Response to Arguments

19. Applicant's arguments filed 10 December 2008 have been fully considered but they are not persuasive. Applicant argues that the combination of Takei et al in view of Kumagai et al or any other secondary reference will not arrive at the present invention because Kumagai et al do not disclose the silane coupling agent in the reaction of the

components that make up the polyurethane resin. Applicant argues that Kumagai et al disclose the addition of the silane coupling agent to a product polyurethane or fluororesin and not with the reaction mixture of a polyol and a polyisocyanate. Applicant argues that there is no expectation that the reaction would even occur between the polyol and the polyisocyanate in the presence of a silane coupling agent containing an imidazole group. These arguments are not convincing because: 1) The claims are not limited to a reaction mixture of a separate polyol, polyisocyanate and a silane coupling agent containing an imidazole but merely to a resin composition comprising these components. Even the addition of a silane coupling agent to a polyurethane product would read on the claim language. 2) Kumagai et al do not limit the addition of the imidazole silane coupling agent to a resin after the resin product is formed. To the contrary, Kumagai et al specifically disclose that the imidazole silane coupling agent may be used as a curing agent for a resin in which it will improve the adhesive strength and mechanical strength of the resin [column 9 lines 56-59]. 3) Takei et al teach the addition of a catalyst (curing agent) for the reaction of the hydroxyl functional polymer (A) and the polyfunctional isocyanate compound (g) such as tertiary amines [column 16 lines 1-6]. Imidazoles are known catalysts for urethane forming reactions, for example see Rasshofer (US 2003/0104241 A1) paragraph [0048] where 1,2-dimethylimidazole and 2-methylimidazole are cited as known tertiary amine polyurethane catalysts. One of ordinary skill in the art at the time the invention was made would have reason to expect the reaction of a polyol and a polyisocyanate to occur and would have reason to expect the reaction to be catalyzed. Additionally, Sato et al (JP 10-280275 A),

submitted on the IDS of 10 December 2008, discloses the reaction products of imidazole compounds reacted silane compound [0006] including gamma-glycidyl propyltrimethoxysilane [0012]. Sato et al teach that these compounds may be simultaneously used as catalysts and coupling agents [0030]. The evidence provided by Rasshofer and Sato does not effect the grounds of rejection but merely provides evidence in response to Applicant's arguments.

Conclusion

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL DOLLINGER whose telephone number is

(571)270-5464. The examiner can normally be reached on Monday - Thursday 7:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MICHAEL DOLLINGER
Examiner
Art Unit 1796

/mmd/

/Randy Gulakowski/
Supervisory Patent Examiner, Art Unit 1796